

Chapter 5

Other Required Analyses

This chapter addresses other required analyses of the proposed BMKV expansion as required by NEPA and CEQA, including cumulative impacts, irreversible and irretrievable commitments of resources, and the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Each of the different analyses is presented below.

Cumulative Impacts

Requirements for Analysis

The CEQs NEPA regulations (40 CFR 1580.25) and State CEQA Guidelines (Section 15130) require a reasonable analysis of the significant cumulative impacts of a proposed project¹. *Cumulative impact* refers to “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” The cumulative impact that results from several closely related projects is:

“the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (State CEQA Guidelines, Section 15355[b]). “The cumulative impact analysis may be less detailed than the analysis of the project’s individual effects” (State CEQA Guidelines Section 15130[b]).

Approach to Cumulative Impact Analysis

The methodology used to develop the cumulative impact analysis included reviewing the current general plans for the City of Novato and Marin County, the *Hamilton Army Wetland Restoration Plan Final EIR/EIS* (Jones & Stokes 1998),

¹ The term *project* used in this SEIR/EIS refers explicitly to the term as defined under CEQ’s regulations for NEPA and the State CEQA Guidelines: “the entirety of an action which has a potential for resulting in a physical change in the environment.” The Corps defines *project* as “an action that has been authorized by Congress,” such as the HWRP. The BMKV expansion has not been authorized by Congress.

the *Oakland Harbor Navigation Improvement (50-Foot) Project Final EIR/EIS* (U.S. Army Corps of Engineers and the Port of Oakland 1998a), and the *Long-Term Management Strategy Draft EIS/EIR* (U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, San Francisco Regional Water Quality Control Board, and State Water Resources Control Board 1996). These projects and plans are described in publicly available documents.

In addition, preliminary information about the Black Point Antenna Field Restoration Project (BPAFRP) was also reviewed (U.S. Army Corps of Engineers 2001a). Public information about the BPAFRP is not currently available because it is in the early planning stages. The current proposal is briefly described here. The project area is located on SLC-owned land in the City of Novato, along the north side of Novato Creek, approximately 1 mile south of State Highway 37 and approximately 1 mile from the confluence of Novato Creek and San Pablo Bay. The site is approximately 0.5 mile from BMKV. The site is surrounded by MCFCWCD land on the west, north, and east. The proposed BMKV expansion would restore approximately 130 acres of tidal wetland adjacent to Novato Creek to provide habitats for threatened and endangered species. The physical changes associated with the BPAFRP would include: removing abandoned concrete work shed and antenna towers; constructing a new levee inland of the existing levee; providing protection, as necessary, for the new levee to ensure wind, wave and tidal actions, and seasonal flood flows do not cause excessive erosion; reestablishing historical tidal action by blocking artificial drainage ditches and removing culverts, as appropriate; breaching the creekside levee to reconnect diked wetland with Novato Creek; and allowing natural sedimentation to restore the site to the equilibrium marsh elevations and a tidal channel system (U.S. Army Corps of Engineers 2001a).

This multiple-source approach provided information about whether the proposed BMKV expansion would contribute to significant cumulative effects.

The proposed BMKV expansion is proposed as a supplement to the HWRP, with the ultimate result being a contiguous natural habitat area. In general, the proposed BMKV expansion would result in a benefit to the environment in terms of biological resources and would preclude development of the site for other intensive land uses.

Geology, Soils, and Seismicity

The San Francisco Bay Area, the region in which the proposed wetland restoration would occur, is one of the most seismically active regions in the nation. The development of the proposed BMKV expansion is not expected to exacerbate or contribute to seismic hazards. Requirements to conduct geotechnical investigations and develop appropriate design for the levees prior to project construction would necessitate fully analyzing and addressing potential

risk for exposure of people to seismic hazards. Because detailed design is expected to result in appropriate levee design, the BMKV expansion is not expected to contribute considerably to a significant cumulative impact.

Surface-Water Hydrology and Tidal Hydraulics

Implementation of any of the restoration alternatives for the BMKV expansion would result in limited but positive reduction in flood risk to the areas surrounding Pacheco Pond. Existing flows from the BMK south lagoon would be accommodated by any of the restoration alternatives. The increased tidal prism that would result from implementation of any of the alternatives would likely cause a limited increase of tidal scouring of the lower portion of Novato Creek, which would be a positive but limited improvement in the flood capacity of this portion of the creek, and a positive but limited benefit to navigability.

Because conceptual design for the BPAFRP has not been completed, no conclusions can be made about the impacts of the BPAFRP on flooding at this time. Like BMKV, increased tidal prism due to tidal restoration at the BPAFRP is likely to result in increased tidal scouring of the lower portion of Novato Creek, which could widen this portion of the creek.

The cumulative effect on Novato Creek morphology from both BMKV and the BPAFRP (if implemented) is expected to be increased channel widening of the lower portion of Novato Creek as a result of the increased tidal prism. This channel widening would result in a loss of existing tidal mudflat and/or marsh along the creek, but this impact would be offset by the significant increase in tidal mudflat and marsh at the BMKV and BPAFRP sites. Channel widening would also be mildly beneficial to the navigability of the last mile of Novato Creek, though it is unknown whether the effect would reduce the need for periodic maintenance dredging to allow for boat access to the BMK lagoons. Channel widening would also increase the flood capacity of this portion of Novato Creek. However, given the dominance of tidal stage in flooding events, it is doubtful that this would significantly lower flood stage.

As described above, the BMKV wetland restoration alternatives are not expected to result in a physical adverse effect on flooding, and thus would not contribute to a cumulative significant physical effect on flooding.

Conclusions regarding the specific impacts of the BPAFRP on flooding cannot be determined at this time because conceptual designs and plans for wetland restoration have not been completed.

Water Quality

Implementation of any of the wetland restoration alternatives along with other projects envisioned in the area, including the BPAFRP, would result in potential water quality impacts on Novato Creek and San Pablo Bay during construction due to sedimentation resulting from breaching of levees and placement of dredged material. However, as described in the previous chapter, construction controls on sedimentation are expected to reduce this impact to less than significant.

The BMKV expansion would also reduce flow from Pacheco Pond to Novato Creek; however this reduction in flow is not expected to have a significant effect on water quality in the creek because of the dominance of tidal flows in this reach of the creek. Both the BMKV expansion and the BPAFRP would increase tidal flow in the last mile of Novato Creek, which would enhance tidal flushing and improve water quality along this portion of the creek.

As the wetlands at the HWRP (including BMKV), BPAFRP, and other sites develop, overall water quality is expected to improve compared to existing conditions because functioning wetlands filter contaminants from runoff and enhance water quality. Furthermore, because the HWRP and the proposed BMKV expansion envision the use of dredged material for wetlands therefore reducing the potential for disposing of the material in the Bay or ocean, the HWRP with proposed the BMKV expansion would result in a net cumulative benefit to water quality of the Bay and ocean. This benefit is one of the objectives of the LTMS.

As discussed in the previous chapter, it is currently unknown whether the effects of the BMKV restoration alternatives on methylmercury production would be more notable than the natural methylation processes. It is generally thought that restoring large areas of tidal marsh throughout the San Francisco Bay region would be beneficial to the environment. However, large-scale restoration projects could expose populations of special-status species to increased concentrations of methylmercury, if new areas of tidal marsh added over a short period of time actually resulted in an increase of mercury methylation over existing conditions. Mitigation Measure WQ-1 requires the implementation of a methylmercury adaptive management plan based on consultation with the relevant local, state, and federal agencies. The likely outcome of the adaptive management plan would be informed decision making that would guide the phased restoration of tidal marshes throughout the estuary. Given the proximity of the BPAFRP to the BMKV expansion site and of both sites to Novato Creek, information and approaches to management of this issue may need to be coordinated between the 2 projects to reduce the potential effects on water quality within Novato Creek. Depending on the findings of the subsequent study, it may be necessary to schedule the amount and timing of restoration activity to reduce mercury methylation within water bodies adjacent to multiple wetland restoration projects. However, because it currently remains unknown whether

wetland restoration would actually result in increased mercury methylation, an adaptive management approach is appropriate.

Apart from the methylmercury potential noted above, the BMKV expansion is not expected to result in a considerable contribution to a significant cumulative water quality impact.

Public Health

Implementation of the proposed HWRP with the BMKV expansion would increase the potential for mosquito production but would not contribute to a significant cumulative impact because mosquito abatement practices would be implemented as deemed necessary on the HWRP and the BMKV expansion site and would be expected to be incorporated on any new mosquito habitat areas that might be created as the part of the BPAFRP. This would eliminate the potential for the BMKV expansion to contribute considerably to a significant cumulative public health impacts.

Biological Resources

The HWRP and the BMKV expansion alternatives would ultimately increase the acreages of tidal marsh habitat available for sensitive wildlife species (see table 5-1). The BPAFRP would also increase tidal marsh habitat. Although existing tidal and nontidal wetlands would be lost due to construction and/or fill activities at these sites, the cumulative effect of restoration is expected to result in a net overall increase in habitat value, particularly for tidal-marsh-dependent species in this portion of San Pablo Bay. Therefore, the proposed BMKV expansion is expected to contribute considerably to a cumulative beneficial impact for biological resources.

Land Use and Public Utilities

The proposed BMKV expansion is generally consistent with the land use designations in local plans. Although, locally important farmland would be converted to a habitat use, the change in use of the project site to wildlife habitat is a generally compatible use. Similarly, the proposed restoration of the BPAFRP site is expected to be consistent with land use designations and result in a less-than-significant loss of relatively low-quality farmland. The proposed BMKV expansion, in combination with the BPAFRP, is not expected to result in a significant cumulative impact on utilities because both projects are expected to accommodate existing utilities and not result in an increase in population, housing, or economic growth that would create additional demand for these services.

Table 5-1. Cumulative Habitats, HWRP and BMKV Expansion

Habitat	BMKV No Action	BMKV Alt. 1	BMKV Alt. 2	BMKV Alt 3	HAAF/SLC No Action (From 404b1)	HAAF/SLC Project (from 404b1)	Total No Action	Total Restored (Alt.1)	Net Change	Total Restored (Alt.2)	Net Change	Total Restored (Alt.3)	Net Change
Tidal Marsh	18	849	889	1204	120	690	138	1539	1401	1579	1441	1894	1756
High Transitional Marsh	0	160	120	30	0	0	0	160	160	120	120	30	30
Tidal Panne	0	0	0	0	0	41	0	41	41	41	41	41	41
Tidal Pond	0	0	0	0	0	4	0	4	4	4	4	4	4
Low Marsh	0	30	30	40	0	0	0	30	30	30	30	40	40
Tidal Wetlands Subtotal	18	1039	1039	1274	120	735	138	1773	1636	1773	1636	2008	1871
Tidal Channels	2	57	52	67	0	22	38	79	41	74	36	89	51
Subtidal Channels	0	90	85	130	0	44	0	134	134	129	129	174	174
Other Tidal Subtotal	2	147	137	197	0	66	122	213	91	203	81	263	141
Saline Seep/Non-Tidal Salt Marsh	21	0	0	0	0	0	21	0	-21	0	-21	0	-21
Brackish Open Water and Emergent Marsh	52	50	0	50	17	2	69	52	-17	2	-67	52	-17
Seasonal Wetland	114	40	210	0	36	62	150	102	-48	272	122	62	-88
Non-Tidal Habitats Total	187	90	210	50	53	64	240	154	-86	274	34	114	-126
Agricultural Ponding	151	0	0	0	0	0	151	0	-151	0	-151	0	-151
Agriculture (Non-ponding)	1090	0	0	0	0	0	1090	0	-1090	0	-1090	0	-1090
Grassland/Upland	129	300	190	55	493	85	622	385	-237	275	-347	140	-482
<i>Developed</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>284</i>	<i>0</i>	<i>284</i>	<i>0</i>	<i>-284</i>	<i>0</i>	<i>-284</i>	<i>0</i>	<i>-284</i>
Upland Total	1370	300	190	55	777	85	2146	385	-1761	275	-1871	140	-2006
Tidal Habitats Total	20	1186	1176	1471	120	801	140	1986	1847	1976	1837	2271	2132
Non-Tidal Habitats Total	187	90	210	50	53	64	240	154	-86	274	34	114	-126
TOTAL	1576	1576	1576	1576	950	950	2526	2525	0	2525	0	2525	0

During the dry season, NSD-treated wastewater is used for spray irrigation on the fields adjacent to Highway 37. Provided a new inboard levee were constructed as part of the BPAFRP to prevent introduced tidal flow across the site, the use of the fields for spray irrigation of treated wastewater would not be disrupted.

As noted above, the combined effect of the BMKV expansion and the BPAFRP would be an increase in the tidal prism of the lower portion of Novato Creek, which would result in some channel widening and a minor depth increase in the main channel below the levee design breaches. This would be a minor benefit to navigation.

Hazardous Substances and Waste

The proposed BMKV expansion would not exacerbate or cumulatively contribute to hazardous materials impacts. Prior to commencement of construction activities, the lead agencies would conduct or supervise proper cleanup activities of any potential hazardous substances and/or waste on the BMKV parcel in compliance with local, state, and federal regulations. Similarly, remediation of potential hazardous substances and/or waste, as required, at the adjacent HAAF or SLC parcels would be conducted prior to wetland restoration activities at the site. The additional placement of dredged material on a part of the SLC parcel would decrease the potential for channel formation in this part of the HWRP, thereby decreasing the potential for contaminant migration should a remedial approach involving leaving contaminated soil *in situ* be selected.

Like the SLC parcel, the BPAFRP is a FUDS site because it was owned by the military prior to transfer to the SLC and may contain residual contaminated areas. The military removed underground and aboveground storage tanks and oil filled transformers of various types as part of the transfer of the property to the SLC, but there could be additional contamination on this former military site. The site is therefore listed with FUDS. Similar to the process at the SLC parcel, it is expected that remediation of potential hazardous substances and/or waste, as required, at the BPAFRP would be conducted prior to wetland restoration activities at the site.

Because the HWRP, the proposed BMKV expansion, and the BPAFRP would remediate potentially contaminated media to levels suitable for wetland use, the BMKV expansion is not expected to contribute considerably to a cumulative significant impact related to hazardous substances and waste.

As discussed in chapter 4, both the BMKV expansion and the HWRP would only use dredged sediment material that is found suitable by the DMMO for use as cover material. Therefore, neither is expected to contribute cumulatively to an increased risk of exposure to potentially contaminated sediment. The BPAFRP is not currently proposed to utilize dredged material as part of restoration.

Potential increases in methylation of mercury due to wetland processes involving dredged materials or sediments deposited on the site from Novato Creek or San Pablo Bay that contain mercury was discussed above under *Water Quality*.

Transportation, Air Quality, and Noise

Construction traffic would represent a short-term minor increase in traffic that could contribute to traffic congestion on roadways in the City of Novato and adjacent areas and on state facilities. If construction at the HWRP and the BMKV expansion occurred at the same time, the cumulative effect on local traffic would be increased. Because this traffic would temporarily exacerbate congestion on some roadways that are already operating at an unacceptable LOS (see previous chapter), it is recommended that a construction traffic plan be implemented as part of the final design for both. The construction plan would ensure that construction traffic is routed through appropriate non-congested intersections and is concentrated during off-peak hours. Access to the BPAFRP is by Highway 37, so no cumulative effect from parallel construction at the BMKV site and the BPAFRP site would be expected.

Construction activity associated with the proposed BMKV expansion is expected to result in annual emissions that are below BAAQMD *de minimis* threshold levels for ozone precursors, with implementation of mitigation measures for PM10 and for the dredged material unloading pumps, as discussed in chapter 4. The BAAQMD thresholds are designed to evaluate individual projects in light of the cumulative environment of Bay Area air quality, and thus a project that does not result in emissions above the thresholds does not result in a considerable contribution to a cumulative impact on air quality. Construction activity therefore would not cause or contribute to any new ambient-air-quality standard violation, increase the severity or frequency of any existing standard violation, or delay timely attainment of any standard (see chapter 4). In addition, as discussed in the *Oakland Harbor Navigation Improvement Project EIR/EIS*, cumulative air quality emissions from dredging, transport, reuse, disposal, and other construction activities for that project were found to have a less-than-significant cumulative impact. Thus, the BMKV expansion is not expected to result in a cumulative impact on air quality.

The proposed BMKV expansion is not expected to contribute to significant long-term cumulative noise impacts. It would, however, exacerbate existing noise levels at sensitive receptors during construction. These noise levels could be reduced through appropriate construction practices to a less-than-significant level. With mitigation, the BMKV expansion would not be expected to contribute considerably to a cumulative noise impact.

Cultural Resources

Implementation of the proposed BMKV expansion could contribute to a cumulative loss of cultural resources in the region if appropriate mitigation measures are not implemented. However, as described in chapter 4, mitigation measures would be implemented to reduce this impact to a less-than-significant level, and the BMKV expansion is not expected to result in any considerable contribution to a significant cumulative impact on cultural resources.

Aesthetics

As a result of levee construction associated with the restoration alternatives for the BMKV expansion, portions of existing views from residences along parts of the BMK south lagoon may be obstructed, as discussed in the previous chapter. While this is a direct and significant impact of the BMKV expansion, there are no other proposed developments in the area of these views. Therefore, this is a project effect and not a cumulative effect. The BPAFRP is located north of the north lagoon and thus any associated aesthetic effects would be in a different location and would be experienced by different recipients than those on the southern portion of the south lagoon.

Significant and Unavoidable Impacts

For the proposed BMKV expansion, there are several significant impacts that currently proposed mitigation may not mitigate to a less-than-significant level.

The first is the potential for an increase in methylation of mercury. This could occur through tidal wetland processes that deposit on the site dredged materials or sediments that contain mercury, originating from Novato Creek or San Pablo Bay. The actual potential for this impact to occur is unknown at this time because of the limitations in current scientific understanding of mercury cycling in wetland environments. A scientific study of this specific issue is currently funded and underway through the CALFED program and will be examined through the developing TMDL for mercury in San Francisco Bay. It is proposed that an interagency adaptive management plan be implemented to evaluate the timing, sequencing, and scale of wetland restoration projects in San Pablo Bay and elsewhere in the Bay, as the understanding of this issue advances to the point that reasonable management decisions can be made concerning the progress of wetland restoration projects. However, because scientific understanding of this impact is insufficient to provide a definitive conclusion regarding the significance of the impact and the potential efficacy of mitigation, this impact is currently considered significant and unavoidable.

The offshore off-loading facility and booster-pump platforms for off-loading dredged material may be built on piles that would need to be pile-driven. Pile-driving equipment may produce localized noise that may affect listed fish species and marine mammals in areas immediately adjacent to San Pablo Bay. While population-level impacts are not expected, construction may result in mortality of individual fish and harassment of individual marine mammals present in the immediate vicinity of pile-driving activity. This impact is considered potentially significant. Mitigation is proposed. Even with mitigation, however, there is the potential for individual mortality of listed fish species and harassment of marine mammals immediately adjacent to pile-driving activity. If pile driving was used, this impact would be considered significant and unavoidable.

Alternatives 1 and 2 would include construction of a new levee approximately 1,000 feet east and south of the BMK south lagoon. This levee, initially constructed to approximately 15 feet NGVD (and then settling to 11 feet NGVD over time) would obstruct portions of existing views for southward-facing homes in the southern part of the BMK residential area. Under Alternative 3, the new levee would be built approximately 50 feet south of the BMK south lagoon and would obstruct existing views from the street level/ground floor for southward-facing homes in the southern part of the BMK residential area. While views would still be mostly available from second-story vantage points and unobstructed views would be available from the Bay Trail and optional spur trail (if built), this is considered a significant impact. The height of the new levee, which is designed to protect the BMK south lagoon and residential area from tidal flows that would be introduced into the BMKV site, is the primary determinant in whether views would be obstructed. The levee height is designed for flood protection and thus lowering the levee is not considered feasible. Therefore, this impact is considered significant and unavoidable.

Irreversible and Irretrievable Commitment of Resources

The proposed BMKV expansion would result in the irretrievable commitment of fossil fuels and other energy sources needed to build, operate, and maintain the wetlands. The restoration of the site to wetlands, however, is not considered an irreversible commitment because the landscape could again be converted to other land uses in the future. In sum, the BMKV expansion does not involve converting the land to urban land uses, which tend to be irreversible.

Relationship between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term uses of the environment that would occur with restoration include the impacts on existing wetlands and habitat. As discussed in chapter 4, construction would result in the loss of wetland and upland habitat that presently exists at the BMKV expansion site. However, in the long term, the site is expected to be substantially more productive for fish and wildlife and associated habitat values, through the restoration of tidal wetlands and other habitats on-site.

The timeframes for construction of the different alternatives vary, as does the expected timeframe for the establishment of wetland habitats on the site. Alternatives 1 and 2 both involve the placement of substantial amounts of dredged material, and the overall construction period associated with these alternatives could last up to 13 years. However, a phased approach would be used, allowing completion of restoration activities on individual tidal cells in advance of completion of restoration activities on the entire site, and the first tidal cell may be ready for opening to tidal action approximately 7 to 8 years after commencement of construction. Under Alternatives 1 and 2, low marsh would establish first, with mid/high marsh beginning to establish approximately 10 years after opening the site to tidal action. Therefore, from commencement of construction activities, which would affect existing habitats, mid/high marsh could begin to establish on the first cell approximately 17 to 18 years after commencement of construction. Mid mid/high marsh could begin to establish on the remainder of the site approximately 27 to 28 years after commencement of construction.

Under Alternative 3, the overall construction period would last 5 years, which is less time than under the other 2 alternatives. However, Alternative 3 would rely primarily on natural sedimentation, so wetland would be established much more slowly, with mudflats taking 5 years to establish; low marsh taking 15 years; and mid-marsh taking approximately 40 years. From the commencement of construction, it could take approximately 45 years to establish mid/high marsh. Thus, there would be a longer gap between the loss of existing habitat and the establishment of restoration habitat under Alternative 3.